

WHAT IS CLAIMED IS:

1. A FPD protecting film comprising:

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a film body composed of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides, which is formed on the surface of a substrate; and

a fluoride layer formed on the surface of the film body.

2. A FPD protecting film comprising a film body composed of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides, which is formed on the surface of a substrate by using a fluoride layer-coated powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides.

3. A FPD protecting film according to Claim 1 or 2, wherein the fluoride layer is represented by MO_xF_y (M is Mg, Ca, Sr, Ba, an alkali earth complex metal, a rare earth metal, or a complex metal of an alkali earth metal and rare earth metal, $0 \leq X < 2$, and $0 < Y \leq 4$).

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4. A FPD protecting film according to Claim 1 or 2,

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wherein the fluoride layer is obtained by reaction of a gaseous fluorinating agent with any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides.

5. A FPD protecting film according to Claim 4, wherein the gaseous fluorinating agent comprises a fluorine gas, a hydrogen fluoride gas, BF_3 , SbF_5 or SF_4 .

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1 to 5, wherein the thickness of the fluoride layer is 0.1 to 1000 nm.

7. A method of producing a FPD protecting film comprising the steps of:

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forming a film body composed on any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides on the surface of a substrate; and

treating the surface of the film body with a gaseous fluorinating agent to form a fluoride layer on the surface of the film body.

8. A method of producing a FPD protecting film according to Claim 7, comprising the steps of:

forming a film body on the surface of a substrate in a vacuum; and

treating the surface of the film body with a gaseous fluorinating agent in a vacuum or an inert gas atmosphere without exposing the film body to air.

9. A method of producing a FPD protecting film according to Claim 7, comprising the steps of:

forming a film body on the surface of a substrate in a vacuum;

burning the film body in air to activate the film body after exposing it to air; and

treating the surface of the film body with a gaseous fluorinating agent to form a fluoride layer on the surface of the film body.

10. A method of producing a FPD protecting film according to Claim 8 or 9, further comprising burning in air before, during and after assembly of a panel using the substrate on the surface of which the film body and the fluoride layer are formed.

11. A method of producing a FPD protecting film comprising the steps of:

treating the surfaces of a powder of any one of MgO,

CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides with a gaseous fluorinating agent to coat the powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides with a fluoride layer;

mixing the fluoride layer-coated powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides, a binder, and a solvent to prepare paste or a dispersion for a film; and

forming a film body on the surface of a substrate by using the paste or dispersion for a film.

9 12. A method of producing a FPD protecting film according to any one of Claims ^{7, 8, 9, 10, 11} ~~7 to 11~~, wherein the surface of the film body composed of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides, or the surface of the powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides is treated with the gaseous fluorinating agent at pressure of 1 to 760 Torr.

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13. A method of producing a FPD protecting film according to any one of Claims ^{7, 8, 9, 10, 11} ~~7 to 12~~, wherein the gaseous fluorinating agent comprises a fluorine gas, a hydrogen fluoride gas, BF_3 , SbF_5 or SF_4 .

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14. A powder for producing a FPD protecting film according to Claim 2, comprising any one of MgO , CaO , SrO , BaO , alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides, which is coated with a fluoride layer.

15. A powder according to Claim 14, wherein the thickness of the fluoride layer is 0.1 to 1000 nm.

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16. Paste for a film prepared by mixing a powder of any one of MgO , CaO , SrO , BaO , alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides, which is coated with a fluoride layer, according to Claim 14 or 15, a binder and a solvent.

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17. A dispersion for a film prepared by mixing a powder of any one of MgO , CaO , SrO , BaO , alkali earth compound oxides, rare earth oxides, and compound oxides of alkali

earth oxides and rare earth oxides, which is coated with a fluoride layer, according to Claim 14 or 15, a binder and a solvent.

9428 18. A FPD comprising a protecting film according to any one of Claims ¹⁰²²~~1 to 6~~.

427 19. A method of producing a FPD protecting film comprising the steps of:

forming a protecting film composed of a powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides on a substrate;

treating the surface of the protecting film with a gaseous fluorinating agent to form a fluoride layer on the surface of the protecting film; and

removing the fluoride layer after a FPD is assembled by using the substrate.

20. A method of producing a FPD protecting film according to Claim 19, wherein the fluoride layer is represented by MO_xF_y (M is Mg, Ca, Sr, Ba, an alkali earth complex metal, a rare earth metal, or a complex metal of an alkali earth metal and rare earth metal, $0 \leq X < 2$, and $0 < Y \leq 4$).

21. A method of producing a FPD protecting film according to Claim 19 or 20, wherein the fluoride layer is obtained by reaction of a gaseous fluorinating agent with an alkali earth metal oxide, an alkali earth metal compound oxide, a rare earth metal oxide, or a compound oxide of an alkali earth metal and a rare earth metal.

22. A method of producing a FPD protecting film according to Claim 21, wherein the gaseous fluorinating agent comprises any one of a fluorine gas, a hydrogen fluoride gas, BF_3 , SbF_5 , and SF_4 .

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23. A method of producing a FPD protecting film according to any one of Claims ^{19 OR 20} ~~19 to 22~~, wherein the thickness of the fluoride layer is 0.1 to 1000 nm.

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24. A FPD protecting film produced by a method according to any one of Claims ^{19 OR 20} ~~19 to 23~~.

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25. A FPD comprising a protecting film according to Claim 24.